

AMENDMENTS TO THE CLAIMS

The following listing of claims will replace all prior versions and listings of claims in the application.

1. (Currently Amended) An apparatus for simultaneously obtaining coherent scatter imaging data a plurality of one-dimensional images of an examination object, wherein different ones of said one-dimensional images are formed from radiation coherently scattered at different angles, said apparatus comprising:

- a radiation source arrangement for creating a collimated radiation beam of ionizing radiation centered around an axis of symmetry, which radiation beam is directed through for irradiating said examination object; and

- a radiation detector arrangement comprising a stack of line detector units, each line detector unit being directed towards a small portion of a trajectory of said radiation beam in said examination object to allow a respective ~~substantially fan-shaped ray~~ bundle of said radiation beam as coherently scattered in said examination object to enter ~~a respective~~ the line detector unit and be detected therein; wherein

- each of said line detector units has an elongated opening extending essentially orthogonal to said radiation beam for entry of the respective ~~fan-shaped coherently scattered ray~~ bundle; a row of individual detector elements arranged essentially parallel with said elongated opening for detecting different portions of said ray bundle scattered at different angles with respect to a plane whose normal is parallel with the extension of the elongated opening; and is of the kind wherein charges or photons, generated by interactions between the respective fan-shaped coherently scattered ray bundle and a detection medium within the respective line detector unit and traveling in a direction essentially perpendicular to the respective fan-shaped coherently scattered ray bundle, are detected by said row of individual detector elements; and

- ~~—said line detector units and their respective individual detector elements are formed and oriented so as to allow simultaneous recording of coherent scatter imaging data sufficient to form~~

~~a plurality of one dimensional images, each being composed from radiation as coherently scattered in said examination object in a respective angle; and~~

- said line detector units are direction sensitive and directed towards different adjacent positions along the trajectory of said radiation beam in said examination object so that ~~different fan-shaped-ray~~ bundles of said radiation beam as coherently scattered in different small portions of said examination object enter different ones of said line detector units and are detected therein; and

~~, thus allowing~~ said radiation detector arrangement is adapted to form each one of said plurality of one-dimensional images from a signal from each of said line detector units to be used to form one of said plurality of one dimensional images as detected by an individual detector element thereof, wherein the individual detector elements, which detect the signals used for the formation of a single one-dimensional image, detect portions of the ray bundles that are scattered at a similar angle, whereby said plurality of one-dimensional images are images along the radiation beam as detected at different angles with respect to said plane.

2. (Canceled)

3. (Currently Amended) The apparatus of claim 1 wherein

- the row of individual detector elements of each of said line detector units is essentially orthogonal to a plane, in which said axis of symmetry and said stack of line detector units are located; and

- the individual detector elements of each of said line detector units are separated, elongated, and directed so their extension lines converge in a respective point in said different small portions, and therefore detect different angular portions of the coherently scattered ~~fan-shaped-ray~~ bundle entered into the respective line detector unit so that ~~the~~ a signal from each of said line detector units is needed to form each of said plurality of one-dimensional images.

4. (Currently Amended) The apparatus of claim 1 wherein said line detector units are directed towards different positions along the trajectory of said radiation beam in said examination object, which directions define angles with respect to said axis of symmetry in saida

plane, in which said axis of symmetry and said stack of line detector units are located, which angles have the same magnitude.

5. (Previously Presented) The apparatus of claim 1 wherein said radiation detector arrangement comprises a detector unit arranged in a path of said radiation beam to measure transmission through said examination object simultaneously with simultaneous recording of coherent scatter imaging data.

6. (Original) The apparatus of claim 1 wherein each of said line detector units is a gaseous-based parallel plate detector.

7. (Original) The apparatus of claim 6 wherein each of said line detector units is an avalanche amplification detector.

8. (Currently Amended) The apparatus of claim 1 further comprising a device for moving said radiation source and said radiation detector arrangement relative to said examination object in a direction in a plane orthogonal to said axis of symmetry, while said line detector units are together adapted to record a plurality of line images of radiation as scattered in said examination object ~~at~~ a plurality of different angles to thereby produce coherent scatter imaging data sufficient to form a plurality of two-dimensional images, each being composed from radiation as coherently scattered in said examination object ~~at~~ a respective angle.

9. (Currently Amended) The apparatus of claim 1 further comprising a device for moving said radiation source and said radiation detector arrangement relative to said examination object in two different directions in saida plane orthogonal to said axis of symmetry, while said line detector units are together adapted to record a plurality of line images of radiation as scattered in said examination object ~~at~~ a plurality of different angles to thereby produce coherent scatter imaging data sufficient to form a plurality of three-dimensional images, each being composed from radiation as coherently scattered in said examination object ~~at~~ a respective angle.

10. (Currently Amended) An apparatus for simultaneously obtaining a plurality of one-dimensional images of an examination object, wherein different ones of said one-dimensional images are formed from radiation coherently scattered at different angles, said apparatus ~~coherent scatter imaging data of an examination object comprising:~~

- a radiation source arrangement for creating a radiation beam of ionizing radiation centered around an axis of symmetry having an essentially line-shaped cross section, which radiation beam is directed through extending in a first direction, said radiation beam being provided for irradiating said examination object; and

- a radiation detector arrangement comprising ~~a stack of~~ line detector units arranged in a stack extending in a second direction substantially orthogonal to said first direction and to said radiation beam, all of said ~~which~~ line detector units being direction sensitive and directed towards a single small portion of a trajectory of said radiation beam in said examination object to allow ~~substantially fan-shaped~~ ray bundles of said radiation beam as coherently scattered in said examination object ~~at~~ in different angles with respect to a plane whose normal is essentially parallel with said second direction to enter different ones of said line detector units and be detected therein; wherein

- each of said line detector units has an elongated opening extending essentially parallel with said first direction for entry of the respective ~~fan-shaped~~ coherently scattered ray bundle; a row of individual detector elements arranged essentially parallel with said elongated opening; and is of the kind wherein charges or photons, generated by interactions between the respective ~~fan-shaped~~ coherently scattered ray bundle and a detection medium within the respective line detector unit and traveling in a direction essentially perpendicular to the respective ~~fan-shaped~~ coherently scattered ray bundle, are detected by said row of individual detector elements; and

~~—said line detector units and their respective individual detector elements are formed and oriented so as to allow simultaneous recording of coherent scatter imaging data sufficient to form a plurality of one dimensional images, each being composed from radiation as coherently scattered in said examination object in a respective angle; and wherein~~

~~—said radiation beam of ionizing radiation has a substantially line-shaped cross section;~~

~~—the openings of said line detector units are essentially parallel with the substantially line-shaped cross section of said radiation beam;~~

- said line detector units are directed towards the same small portion of the trajectory of said radiation beam in said examination object; and

~~- the detector elements of each of said line detector units are separated, elongated, and arranged to provide coherent scatter imaging data sufficient to form one of said plurality of one-dimensional images~~said radiation detector arrangement is adapted to form each one of said plurality of one-dimensional images from signals from a single line detector unit as detected by the individual detector elements thereof, whereby said plurality of one-dimensional images are images along said first direction as detected at different angles with respect to said plane.

11. (Currently Amended) The apparatus of claim 10 wherein said line detector units are directed towards the same small portion of the trajectory of said radiation beam in said examination object; which directions define different angles with respect to said axis of symmetry in saida plane, in which said axis of symmetry and said stack of line detector units are located.

12. (Previously Presented) The apparatus of claim 10 wherein said radiation detector arrangement comprises a detector unit arranged in the path of said radiation beam to measure the transmission through said examination object simultaneously with simultaneous recording of coherent scatter imaging data.

13. (Original) The apparatus of claim 10 wherein each of said line detector units is a gaseous-based parallel plate detector.

14. (Original) The apparatus of claim 13 wherein each of said line detector units is an avalanche amplification detector.

15. (Currently Amended) The apparatus of claim 10 further comprising a device for moving said radiation detector arrangement and said radiation source relative to said examination object, while said line detector units are together adapted to record a plurality of line images of radiation as scattered in said examination object ~~at~~ in a plurality of different angles to thereby produce coherent scatter imaging data sufficient to form a plurality of images, each being composed from radiation as coherently scattered in said examination object in a respective angle.

16. (Currently Amended) A method for simultaneously obtaining ~~coherent scatter imaging data of an examination object~~ a plurality of one-dimensional images of an examination

object, wherein different ones of said one-dimensional images are formed from radiation coherently scattered at different angles, said method comprising the steps of:

- directing a collimated radiation beam of ionizing radiation ~~centered around an axis of symmetry through~~towards said examination object; and

- directing each one of a plurality of line detector units arranged in a stack towards a small portion of a trajectory of said radiation beam in said examination object to allow a respective ~~substantially fan-shaped~~ ray bundle of said radiation beam as coherently scattered in said examination object to enter the line detector unit; and

- detecting said ~~fan-shaped~~ ray bundles entered into said line detector units, wherein

- each of said line detector units has an elongated opening extending essentially orthogonal to said radiation beam for entry of the respective ~~fan-shaped~~ coherently scattered ray bundle; a row of individual detector elements arranged essentially parallel with said elongated opening for detecting different portions of said ray bundle scattered at different angles with respect to a plane whose normal is parallel with the extension of the elongated opening; and is of the kind wherein charges or photons, generated by interactions between the respective ~~fan-shaped~~ coherently scattered ray bundle and a detection medium within the line detector unit and traveling in a direction essentially perpendicular to the respective ~~fan-shaped~~ coherently scattered ray bundle, are detected by said row of individual detector elements; and

~~said line detector units and their respective individual detector elements are formed and oriented so as to allow simultaneous recording of coherent scatter imaging data sufficient to form a plurality of one dimensional images, each being composed from radiation as coherently scattered in said examination object in a respective angle;~~

- said line detector units are direction sensitive and directed towards different adjacent positions along the trajectory of said radiation beam in said examination object so that different ~~fan-shaped~~ ray bundles of said radiation beam as coherently scattered in different small portions of said examination object enter different ones of said line detector units and are detected therein; and

~~- the row of detector elements of each of said line detector units is essentially orthogonal to a plane, in which said axis of symmetry and said stack of line detector units are located; and~~

~~- the detector elements of each of said line detector units are separated, elongated, and directed so that their extension lines converge in a respective point in said different small portions, and therefore detect different angular portions of the fan-shaped ray bundle entered into the respective line detector unit, thus allowing a signal from each of said line detector units to be used to form each of said plurality of one-dimensional images~~each one of said plurality of one-dimensional images are formed from a signal from each of said line detector units as detected by an individual detector element thereof, wherein the individual detector elements, which detect the signals used for the formation of a single one-dimensional image, detect portions of the ray bundles that are scattered at a similar angle, whereby said plurality of one-dimensional images are images along the radiation beam as detected at different angles with respect to said plane.

Claims 17-20. (Canceled)

21. (Currently Amended) A method for simultaneously obtaining coherent scatter imaging data of an examination object a plurality of one-dimensional images of an examination object, wherein the different ones of said one-dimensional images are formed from radiation coherently scattered at different angles, said method comprising the steps of:

~~- directing a radiation beam of ionizing radiation centered around an axis of symmetry through~~having an essentially line-shaped cross section extending in a first direction towards said examination object; and

~~- directing a plurality of direction sensitive line detector units arranged in a stack,~~which extends in a second direction substantially orthogonal to said first direction and to said radiation beam, towards a single small portion of a trajectory of said radiation beam in said examination object to allow substantially fan-shaped ray bundles of said radiation beam as coherently scattered in said examination object at different angles with respect to a plane whose normal is essentially parallel with said second direction to enter different ones of said line detector units; and

- separately detecting said ~~fan-shaped~~ ray bundles entered into said line detector units, wherein

- each of said line detector units has an elongated opening extending essentially parallel with said first direction for entry of the respective ~~fan-shaped~~ coherently scattered ray bundle; a row of individual detector elements arranged essentially parallel with said elongated opening; and is of the kind wherein charges or photons, generated by interactions between the respective ~~fan-shaped~~ coherently scattered ray bundle and a detection medium within the respective line detector unit and traveling in a direction essentially perpendicular to the respective ~~fan-shaped~~ coherently scattered ray bundle, are detected by said row of individual detector elements; and

~~said line detector units and their respective individual detector elements are formed and oriented so as to allow simultaneous recording of coherent scatter imaging data sufficient to form a plurality of one dimensional images, each being composed from radiation as coherently scattered in said examination object in a respective angle; and wherein~~

~~said radiation beam of ionizing radiation has a substantially line shaped cross section;~~

~~the openings of said line detector units are essentially parallel with the substantially line shaped cross section of said radiation beam;~~

- said line detector units are directed towards the same small portion of the trajectory of said radiation beam in said examination object; and

~~the detector elements of each of said line detector units are separated, elongated, and arranged to provide coherent scatter imaging data sufficient to form one of said plurality of one dimensional images~~each one of said plurality of one-dimensional images is formed from signals from a single line detector unit as detected by the individual detector elements thereof, whereby said plurality of one-dimensional images are images along said first direction as detected at different angles with respect to said plane.